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by

T. Tanaka, A. Sato, K. Kawamura

Foreword

In the past, the mother shells used for egg collection were mainly shells sown in Kawauchi. However, as their recent state of maturation became unsatisfactory, this year we used also scallops produced in the Funka Bay of Hokkaido. The purpose was to be able to carry out artificial seed collection after the spawning season among the mother shells produced in the Mutsu Bay had ended. The method adopted for rearing the larvae was almost the same as in the past and we obtained several attached juvenile shells.

Material and Method

Mother shells: Five times, viz on March 29, April 4, April 11, April 19, April 27, 1972 we gathered with dredge nets shells (more than 3 years old) which had been sown in Kawauchi

and carried them on the same day to our place. We also gathered on April 25 scallops (2 years old) reared through suspended cultivation in the Funka Bay of Hokkaido and carried them on the 27th to our center. We measured the growth index (G.I.) of the particular mother shells

$$\text{G.I.} = \frac{\text{weight of reproduction organs}}{\text{weight of soft parts}} \times 100\ (\%).$$

Spawning induction: As soon as they reached the site, the mother shells were placed in toro boxes*. Filtered seawater was made to flow (through the boxes). Thereafter we induced spawning by running seawater warmed to 14 - 15°C.

Rearing of the larvae: Using 500 L furukontai** tanks, the larvae were accommodated to a density of 300 - 1,160 individuals per L. They were reared at 13°C and 18°C while air was being passed gently. For feeding, we gave them Monochrysis lutheri at a daily rate of 2,000 - 30,000 per L. Every 3 - 4 days, the entire rearing water was changed. Hizex*** film and the fibrous skin of hemp palm were used as attachment surface.

Results and Discussion

Table 1 shows the changes in the growth index of the mother shells. As shown in the Table, the growth index of the Kawauchi produced scallops decreases slowly from March 29 on.

With regard to the index values at the time when the peak is reached, 20 - 28% is particularly common. A few individuals exceeded 30%. In the past, the G.I. at spawning time for the Kawauchi produced scallops was usually around 30% and the highest values were around 40% so that by comparison this year's G.I. may be considered low. Meanwhile, the G.I. of the scallops produced in the Funka Bay of Hokkaido showed on April 27 an average value of 34.9% which is far superior to this year's peak G.I. for the Kawauchi produced scallops.

Translator's Note:

* Boxes of about 2' x 2½' and 6" deep used in Japan as fish container.

** As transliterated; meaning uncertain; probably some synthetic material.

*** Attempted rendering; meaning uncertain; probably some synthetic plastic material.

Table 1 Growth of the mother shells p. 101

場所a / 採捕月日b / G.I.	川 · Kawauchi 内					北海道d
	3月29日	4月 4日	4月11日	4月19日	4月27日	4月27日
	MARCH 31	APRIL 4	APRIL 11	APRIL 19	APRIL 27	APRIL 27
11~12	1 個e	個e	個e	1 個e	1 個e	個e
13~14	1	1		4	5	
15~16				3	3	
17~18	3		1	2	3	
19~20	6	2	2	4	2	
21~22	5	4	4	4	1	
23~24	7	2	1	2		
25~26	5	4	3		1	
27~28	4	6	3			1
29~30	1					
31~32	4		1			
33~34	1		2			9
35~36	1	1	1			1
37~38	1		1		1	1
39~40				1		3
41~42						4
誘発率f	55%	15	—	—	—	75

Key:

a location
b collection date
c in rivers
d Hokkaido
e individual
f induction rate

Although the induction rate with the Kawauchi-produced mother shells had decreased, we noted a satisfactory response to induction among the scallops transported from the Funka Bay. As spawning in the Funka Bay starts after the spawning among the Mutsu Bay scallops has ended, there are several possible methods such as extending the spawning season by curbing the spawning by the Mutsu Bay produced scallops through repeated egg collection or bringing mother shells from the Funka Bay.

The rearing progress of the larvae is shown in Table 2.

Prior to immersion of the attachment surfaces for the larvae obtained from the Kawauchi-produced mother shells, the survival rate was 10%, 30%, 23%, 8%. For the larvae obtained from the Funka Bay-produced mother shells, it was 10%, 4%. These survival rates are on the whole not high, and only a few larvae were seen to attach themselves. p. 102

Table 2 Rearing progress of larvae

days avg. length range of length survival Temp.

母貝の産地 a	受精月日 b	受精後の日c数	平均殻長 d (μ)	殻長範囲 e (μ)	生残率 f (%)	水温 g (°C)
川h内	3月29日 MARCH 29	5	125	118～131	100	15.1
		8	—	143～150	31	15.4
		11	156	130～170	23	18.0
		14	182	155～205	16	16.0
		17	202	165～245	11	18.0
		19	225	150～285	10	18.0
	4月4日 APRIL 4	5	—	—	100	18.0
		8	129	129～160	50	18.0
		11	167	140～190	42	18.0
		14	180	201～220	38	18.0
		17	231	170～285	30	18.0
		18	250	190～270	30	18.0

母貝の産地 a	受精月日 b	受精後の日c数	平均殻長 d (μ)	殻長範囲 e (μ)	生存率 f (%)	水温 g (°C)
川h内	4月13日 APRIL 13	4	—	—	100	13.0
		7	138	125～150	70	13.5
		10	170	150～158	67	13.0
		13	—	—	—	13.0
		16	210	190～220	27	13.5
		19	235	220～250	23	13.5
		22	240	220～260	23	13.5
		24	254	160～300	23	13.5
	4月29日 APRIL 29	4	—	—	100	18.0
		7	140	125～150	77	18.0
		10	165	140～190	46	18.0
		13	—	—	—	18.0
		16	236	210～260	21	18.0
		19	255	240～270	8	18.0
i 唄火湾		5	123	110～130	100	18.0
		11	166	115～185	47	18.0
		17	194	150～230	24	—
		19	210	190～280	10	17.5
		5	123	110～130	100	13.5
		13	163	130～180	41	13.5
		17	164	130～220	26	13.6
		23	208	190～240	4	—

Key:

a origin of mother shells
b date of fecundation
c number of days following fecundation
d average shell length (μ)
e range of shell length (μ)
f survival rate (%)
g water temperature
h Kawauchi
i Funka Bay